Licensed Copy: Institute of Technology Tallaght, Institute of Technology, Fri Nov 09 10:23:05 GMT+00:00 2007, Uncontrolled Copy, (c) BSI

BRITISH STANDARD

BS EN ISO
12402-8:2006

Personal flotation devices —

Part 8: Accessories — Safety requirements and test methods

The European Standard EN ISO 12402-8:2006 has the status of a British Standard

ICS 13.340.70

NO COPYING WITHOUT BSI PERMISSION EXCEPT AS PERMITTED BY COPYRIGHT LAW

BSI
British Standards

Licensed Copy: Institute of Technology Tallaght, Institute of Technology, Fri Nov 09 10:23:05 GMT+00:00 2007, Uncontrolled Copy, (c) BSI

National foreword

This British Standard is the official English language version of EN ISO 12402-8:2006. It is identical to ISO 12402-8:2006. It supersedes BS EN 394:1994 which is withdrawn.

The UK participation in its preparation was entrusted by Technical Committee PH/3, Protective clothing, to Subcommittee PH/3/6, Buoyancy garments, which has the responsibility to:

— aid enquirers to understand the text;

— present to the responsible international/European committee any enquiries on the interpretation, or proposals for change, and keep UK interests informed;

— monitor related international and European developments and promulgate them in the UK.

A list of organizations represented on this subcommittee can be obtained on request to its secretary.

Cross-references

The British Standards which implement international or European publications referred to in this document may be found in the *BSI Catalogue* under the section entitled "International Standards Correspondence Index", or by using the "Search" facility of the *BSI Electronic Catalogue* or of British Standards Online.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

Compliance with a British Standard does not of itself confer immunity from legal obligations.

Summary of pages

This document comprises a front cover, an inside front cover, the EN ISO title page, the EN ISO foreword page, the ISO title page, pages ii to vi, pages 1 to 11 and a back cover.

The BSI copyright notice displayed in this document indicates when the document was last issued.

This British Standard was published under the authority of the Standards Policy and Strategy Committee on 31 March 2006

© BSI 2006

ISBN 0 580 48031 3

Amendments issued since publication

Amd. No.	Date	Comments

标准分享网 www.bzfxw.com 免费下载

Licensed Copy: Institute of Technology Tallaght, Institute of Technology, Fri Nov 09 10:23:05 GMT+00:00 2007, Uncontrolled Copy, (c) BSI

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN ISO 12402-8

February 2006

ICS 13.340.70

Supersedes EN 394:1993

English Version

Personal flotation devices - Part 8: Accessories - Safety requirements and test methods (ISO 12402-8:2006)

Equipements individuels de flottabilité - Partie 8: Accessoires - Exigences de securité et méthodes d'essai (ISO 12402-8:2006)

Persönliche Auftriebsmittel - Teil 8: Zubehörteile - Sicherheitstechnische Anforderungen und Prüfverfahren (ISO 12402-8:2006)

This European Standard was approved by CEN on 23 January 2006.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the Central Secretariat has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

Management Centre: rue de Stassart, 36 B-1050 Brussels

© 2006 CEN All rights of exploitation in any form and by any means reserved worldwide for CEN national Members.

Ref. No. EN ISO 12402-8:2006: E

Licensed Copy: Institute of Technology Tallaght, Institute of Technology, Fri Nov 09 10:23:05 GMT+00:00 2007, Uncontrolled Copy, (c) BSI

Foreword

This document (EN ISO 12402-8:2006) has been prepared by Technical Committee CEN/TC 162 "Protective clothing including hand and arm protection and lifejackets", the secretariat of which is held by DIN, in collaboration with Technical Committee ISO/TC 188 "Small craft".

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by August 2006, and conflicting national standards shall be withdrawn at the latest by August 2006.

This document supersedes EN 394:1993.

This document has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directive(s).

For relationship with EU Directive(s), see informative Annex ZA, which is an integral part of this document.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

标准分享网 www.bzfxw.com 免费下载

Licensed Copy: Institute of Technology Tallaght, Institute of Technology, Fri Nov 09 10:23:05 GMT+00:00 2007, Uncontrolled Copy, (c) BSI

INTERNATIONAL STANDARD

ISO 12402-8

First edition
2006-02-01

Personal flotation devices —

Part 8: Accessories — Safety requirements and test methods

Équipements individuels de flottabilité —

Partie 8: Accessoires — Exigences de sécurité et méthodes d'essai

Reference number
ISO 12402-8:2006(E)

Licensed Copy: Institute of Technology Tallaght, Institute of Technology, Fri Nov 09 10:23:05 GMT+00:00 2007, Uncontrolled Copy, (c) BSI

标准分享网 www.bzfxw.com 免费下载

Licensed Copy: Institute of Technology Tallaght, Institute of Technology, Fri Nov 09 10:23:05 GMT+00:00 2007, Uncontrolled Copy, (c) BSI

Contents

Page

Foreword ... iv

Introduction ... v

1 Scope ... 1

2 Normative references ... 1

3 Terms and definitions ... 2

4 Classification of personal flotation devices ... 3

5 Specifications and test methods ... 3
5.1 General ... 3
5.2 Whistles ... 4
5.3 Deck safety harness and safety lines ... 4
5.4 Buddy lines ... 4
5.5 Sprayhood ... 5
5.6 Protective covers ... 6
5.7 Multi-chamber buoyancy systems ... 7

Annex A (informative) Classification of personal flotation devices ... 8

Annex ZA (informative) Relationship between this Standard and the Essential Requirements of EU Directive 89/686 EEC ... 11

Bibliography ... 10

Licensed Copy: Institute of Technology Tallaght, Institute of Technology, Fri Nov 09 10:23:05 GMT+00:00 2007, Uncontrolled Copy, (c) BSI

Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO 12402-8 was prepared by the European Committee for Standardization (CEN) Technical Committee CEN/TC 162, *Protective clothing including hand and arm protection and lifejackets*, in collaboration with Technical Committee ISO/TC 188, *Small craft*, in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

ISO 12402 consists of the following parts, under the general title *Personal flotation devices*:

— *Part 1: Lifejackets for seagoing ships — Safety requirements*

— *Part 2: Lifejackets, performance level 275 — Safety requirements*

— *Part 3: Lifejackets, performance level 150 — Safety requirements*

— *Part 4: Lifejackets, performance level 100 — Safety requirements*

— *Part 5: Buoyancy aids (level 50) — Safety requirements*

— *Part 6: Special purpose lifejackets and buoyancy aids — Safety requirements and additional test methods*

— *Part 7: Materials and components — Safety requirements and test methods*

— *Part 8: Accessories — Safety requirements and test methods*

— *Part 9: Test methods*

— *Part 10: Selection and application of personal flotation devices and other relevant devices*

标准分享网 www.bzfxw.com 免费下载

Licensed Copy: Institute of Technology Tallaght, Institute of Technology, Fri Nov 09 10:23:05 GMT+00:00 2007, Uncontrolled Copy, (c) BSI

Introduction

ISO 12402 has been prepared to give guidance on the design and application of personal flotation devices (hereafter referred to as PFDs) for persons engaged in activities, whether in relation to their work or their leisure, in or near water. PFDs manufactured, selected, and maintained to this standard should give a reasonable assurance of safety from drowning to a person who is immersed in water.

Requirements for lifejackets on large, commercial seagoing ships are regulated by the International Maritime Organisation (IMO) under the International Convention for the Safety of Life at Sea (SOLAS). ISO 12402-1 addresses lifejackets for seagoing ships.

ISO 12402 allows for the buoyancy of a PFD to be provided by a wide variety of materials or designs, some of which may require preparation before entering the water (e.g. inflation of chambers by gas from a cylinder or blown in orally). However, PFDs can be divided into the following two main classes:

— those which provide face up in-water support to the user regardless of physical conditions (lifejackets), and

— those which require the user to make swimming and other postural movements to position the user with the face out of the water (buoyancy aids).

Within these main two classes there are a number of levels of support, types of buoyancy, activation methods for inflatable devices, and auxiliary items (such as location aids), all of which will affect the user‘s probability of survival. Within the different types of buoyancy allowed, inflatable PFDs either provide full buoyancy without any user intervention other than arming (i.e. PFDs inflated by a fully automatic method) or require the user to initiate the inflation. Hybrid PFDs always provide some buoyancy but rely on these same methods as inflatable PFDs to achieve full buoyancy. With inherently buoyant PFDs, the user only needs to put the PFD on to achieve the performance of its class.

PFDs that do not require intervention (automatically operating PFDs) are suited to activities where persons are likely to enter the water unexpectedly; whereas PFDs requiring intervention (e.g. manually inflated PFDs) are only suitable for use if the user believes there will be sufficient time to produce full buoyancy, or help is close at hand. In every circumstance, the user should ensure that the operation of the PFD is suited to the specific application. The conformity of a PFD to this part of ISO 12402 does not imply that it is suitable for all circumstances. The relative amount of required inspection and maintenance is another factor of paramount importance in the choice and application of specific PFDs.

ISO 12402 is intended to serve as a guide to manufacturers, purchasers, and users of such safety equipment in ensuring that the equipment provides an effective standard of performance in use. Equally essential is the need for the designer to encourage the wearing of the equipment by making it comfortable and attractive for continuous wear on or near water, rather than for it to be stored in a locker for emergency use. Throwable devices and flotation cushions are not covered by this part of ISO 12402. The primary function of a PFD is to support the user in reasonable safety in the water. Within the two classes, alternative attributes make some PFDs better suited to some circumstances than others or make them easier to use and care for than others. Important alternatives allowed by ISO 12402 are the following:

— to provide higher levels of support (levels 100, 150, or 275) that generally float the user with greater water clearance, enabling the user’s efforts to be expended in recovery rather than avoiding waves; or to provide lighter or less bulky PFDs (levels 50 to 100);

— to provide the kinds of flotation (inherently buoyant foam, hybrid, and inflatable) that will accommodate the sometimes conflicting needs of reliability and durability, in-water performance, and continuous wear;

Licensed Copy: Institute of Technology Tallaght, Institute of Technology, Fri Nov 09 10:23:05 GMT+00:00 2007, Uncontrolled Copy, (c) BSI

— to provide automatically operating (inherently buoyant or automatically inflated) PFDs that float users without any intervention on their part, except in initially donning the PFD (and regular inspection and rearming of inflatable types), or to provide user control of the inflatable PFDs buoyancy by manual and oral operation; and

— to assist in detection (location aids) and recovery of the user.

PFDs provide various degrees of buoyancy in garments that are light in weight and only as bulky and restrictive as needed for their intended use. They will need to be secure when worn, in order to provide positive support in the water and to allow the user to swim or actively assist herself/himself or others. The PFD selected shall ensure that the user is supported with the mouth and nose clear of the water under the expected conditions of use and the user's ability to assist.

Under certain conditions (such as rough water and waves), the use of watertight and multilayer clothing, which provide (intentionally or otherwise) additional buoyancy, or the use of equipment with additional weight (such as tool belts) will likely alter the performance of the PFD. Users, owners and employers need to ensure that this is taken into account when selecting a PFD. Similarly, PFDs may not perform as well in extremes of temperature, although fully approved under this part of ISO 12402. PFDs may also be affected by other conditions of use, such as chemical exposure and welding, and may require additional protection to meet the specific requirements of use. If the user intends taking a PFD into such conditions, she/he has to be assumed that the PFD will not be adversely affected. This part of ISO 12402 also allows a PFD to be an integral part of a safety harness designed to conform to ISO 12401, or an integral part of a garment with other uses, for example to provide thermal protection during immersion, in which case the complete assembly as used is required to conform to this part of ISO 12402.

In compiling the attributes required of a PFD, consideration has also been given to the potential length of service that the user might expect. Whilst a PFD which needs to be of substantial construction and material, its potential length of service often depends on the conditions of use and storage which are the responsibility of the owner, user and/or employer. Furthermore, whilst the performance tests included are believed to assess relevant aspects of performance in real life use, they do not accurately simulate all conditions of this. For example, the fact that a device passes the self-righting tests in swimming attire, as described herein, does not guarantee that it will self-right an unconscious user wearing waterproof clothing, neither can it be expected to completely protect the airway of an unconscious person in rough water. Waterproof clothing can trap air and further impede the self-righting action of a lifejacket.

It is essential that owners, users and employers choose those PFDs that meet the correct standards for the circumstances in which they will be used. Manufacturers and those selling PFDs have to make clear to prospective purchasers the product properties and alternative choices and the limitations to normal use, prior to the purchase.

Similarly, those framing legislation regarding the use of these garments should consider carefully which class and performance levels are most appropriate for the foreseeable conditions of use, allowing for the more higher risk circumstances. These higher risk circumstances should account for the highest probabilities of occurence of accidental immersion and the expected consequences in such emergencies. More information for the selection and application is given in ISO 12402-10.

标准分享网 www.bzfxw.com 免费下载

Licensed Copy: Institute of Technology Tallaght, Institute of Technology, Fri Nov 09 10:23:05 GMT+00:00 2007, Uncontrolled Copy, (c) BSI

Personal flotation devices —

Part 8:
Accessories — Safety requirements and test methods

1 Scope

This part of ISO 12402 specifies the safety requirements and test methods for accessories used for personal flotation devices (PFDs).

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 3303, *Rubber- or plastics-coated fabrics — Determination of bursting strength*

ISO 9150, *Protective clothing — Determination of behaviour of materials on impact of small splashes of molten metal*

ISO 12401, *Small craft — Deck safety harness and safety line for use on recreational craft — Safety requirements and test methods*

ISO 12402-1, *Personal flotation devices — Part 1: Lifejackets for seagoing ships — Safety requirements*

ISO 12402-2, *Personal flotation devices — Part 2: Lifejackets, performance level 275 — Safety requirements*[1)]

ISO 12402-3, *Personal flotation devices — Part 3: Lifejackets, performance level 150 — Safety requirements*[1)]

ISO 12402-4, *Personal flotation devices — Part 4: Lifejackets, performance level 100 — Safety requirements*[1)]

ISO 12402-5, *Personal flotation devices — Part 5: Buoyancy aids (level 50) — Safety requirements*[1)]

ISO 12402-6, *Personal flotation devices — Part 6: Special purpose lifejackets and buoyancy aids — Safety requirements and additional test methods*[1)]

ISO 12402-7, *Personal flotation devices — Part 7: Materials and components — Safety requirements and test methods*[1)]

ISO 12402-9, *Personal flotation devices — Part 9: Test methods*[1)]

ISO 13938-1, *Textiles — Bursting properties of fabrics — Part 1: Hydraulic method for determination of bursting strength and bursting distension*

---

1) To be published.

Licensed Copy: Institute of Technology Tallaght, Institute of Technology, Fri Nov 09 10:23:05 GMT+00:00 2007, Uncontrolled Copy, (c) BSI

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1
personal flotation device
PFD
garment or device which, when correctly worn and used in water, will provide the user with a specific amount of buoyancy which will increase the likelihood of survival

3.2
inherently buoyant material
material which is permanently less dense than water

3.3
automatically operating PFD
PFD in which buoyancy is provided by permanent means (inherently buoyant material) or by suitable means (gas inflation) effected by a system which automatically activates upon immersion and which, except for the inspection and rearming of inflatable types, when correctly donned requires no further action by the user

3.4
automatically inflated PFD
PFD in which inflation is effected as a result of immersion without the user carrying out any action at the time of immersion

3.5
manually inflated PFD
PFD in which inflation is effected as a result of the user operating a mechanism

3.6
orally inflated PFD
PFD inflated by mouth to produce buoyancy

3.7
PFD with secondary donning
PFD for which additional donning or adjustment is needed to place the PFD in its functioning position from the position it is normally worn

NOTE Pouch-type devices are examples of the type of PFDs which usually require such additional positioning.

3.8
vest-type PFD
PFD covering the upper trunk of the user like a vest

3.9
yoke-type PFD
PFD worn around the back of the neck and secured by a waist strap

3.10
emergency light
device which emits light so as to increase the chances of a wearer being located

3.11
multi-chamber buoyancy system
system that divides the buoyancy provided by an inflatable lifejacket into two or more separate compartments, such that if mechanical damage occurs to one, others can still operate and provide buoyancy so as to aid the user when immersed

标准分享网 www.bzfxw.com 免费下载

Licensed Copy: Institute of Technology Tallaght, Institute of Technology, Fri Nov 09 10:23:05 GMT+00:00 2007, Uncontrolled Copy, (c) BSI

3.12
deck safety harness and safety line
device that allows a user to be securely attached to a strong point on a vessel or on shore, so as to prevent the user from falling into the water, or, if he does fall into the water, to prevent him from being separated from the vessel or shore

3.13
buddy line
length of cord which can be tied or otherwise fixed to another person or to that person's PFD or other objects, so as to keep a user in the vicinity of that person or object with a view to making location and thus rescue easier

3.14
lifting loop
device which facilitates manual recovery of a person from water

3.15
sprayhood
cover brought or placed in front of the airways of a user in order to reduce or eliminate the splashing of water from waves or the like onto the airways and thereby to promote the survival of the user in rough water conditions

3.16
protective cover
cover that is normally in place over the functional elements of a PFD in order to protect them from physical damage, or snagging on external objects

NOTE 1 The protective cover may be designed to provide additional properties, i.e. to make the PFDs suitable for use when the subject is exposed to additional hazards, e.g. significant abrasion, molten metal splash, flame and fire.

NOTE 2 The inflatable chamber of an inflatable PFD is an example of a functional element.

3.17
overpressure relief valve
valve which may be used in an inflatable system to avoid the likelihood of destruction caused by overpressure

3.18
whistle
device which, when blown by mouth, produces an audible sound which can aid in the location of the user

3.19
hybrid type PFD
PFD of combined buoyancy types, i.e. inherent and inflatable

4 Classification of personal flotation devices

An overview of this classification is given in Annex A for information.

5 Specifications and test methods

5.1 General

5.1.1 When accessories complying with this part of ISO 12402 are attached to or included with PFDs conforming to ISO 12402-1 to ISO 12402-6, both the accessory and the PFD shall remain in conformity with the relevant standards.

Licensed Copy: Institute of Technology Tallaght, Institute of Technology, Fri Nov 09 10:23:05 GMT+00:00 2007, Uncontrolled Copy, (c) BSI

5.1.2 Accessories complying with this part of ISO 12402 or accessories designated to be used with PFDs shall be attached to the PFD before testing the PFD according to ISO 12402-9.

5.1.3 Neither component claimed to be usable in conjunction with the other shall have any attachment which impairs the operation or performance of the other, or that is likely to cause damage to the other.

5.1.4 Any integral combination or claimed permissible or usable combination shall conform to the requisite standards on each individual item, and in each permissible combination. Only then can the combination be stated and marked as complying with the relevant part of ISO 12402. Whilst it is not required that the combination be donned or doffed in a single operation, each component shall satisfy its required tests when in combination and when separated, unless it is of permanently integral construction. Fail-safe criteria shall be as specified in the relevant standard.

NOTE Suits and the combination of a lifejacket and a safety harness are examples of combinations.

5.2 Whistles

Whistles shall be non-metallic and robust in construction, free from all burrs, and shall not rely on any moving part for the production of sound. They shall comply with the relevant material requirements as specified in ISO 12402-7.

The attachment and the cord of the whistle shall withstand a static load of $(200\ ^{+50}_{0})$ N when tested in accordance with 5.4.

Three specimens shall be tested by being blown as hard as possible by a subject of between 20 years and 30 years of age and free from all known impairments to pulmonary function, in an outside and open area during calm clear weather. The sound generated shall be shown at least at an instant to have exceeded 100 dB(A) measured at a distance of $(5 \pm 0{,}1)$ m directly in front of the whistle. The predominant frequency shall be (2 ± 1) kHz and shall be multi-tone.

The whistle shall also be shown to be capable of producing sound in air immediately following immersion in fresh water. The whistle shall be attached to cord or line of a length sufficient to permit its use, which shall in turn be attached securely to the lifejacket or buoyancy aid. It shall be stowed on the device in such a way that the performance of the lifejacket is not affected, but so that it can be removed for use with either hand of the wearer, and can be stowed by the wearer. Whistles complying with this part of ISO 12402 shall be marked with an exclusive permanent identifying marking that can be traced to conformance with this part of ISO 12402.

5.3 Deck safety harness and safety lines

Deck safety harnesses and safety lines to be used for lifejackets shall comply with ISO 12401.

5.4 Buddy lines

Buddy lines shall be made from synthetic cord. The buddy line shall be fitted to a test rig and withstand (750 ± 50) N for at least 3 min without any damage when tested in accordance with ISO 12402-9:—[2)], 5.5.1.5. The line to be tested shall be at least 1 500 mm in length or of the length indicated by the manufacturer and shall have attached securely to the free end a wooden or plastic toggle. The other end of the line shall be attached securely to the retention system of the PFD. The force required to accomplish separation of the buddy line shall be greater than 750 N and less than 1 500 N. The toggle and line shall be stowed in such a way that they do not create a hazard or affect the normal operation of the PFD. The buddy line shall be readily accessible to at least one of the wearer's hands. The line and toggle shall float in both fresh and sea water. PFDs with buddy lines conforming to this part of ISO 12402 shall be marked with “ISO 12402-8”, suffixed with the words “buddy line”.

2) To be published.

标准分享网 www.bzfxw.com 免费下载

Licensed Copy: Institute of Technology Tallaght, Institute of Technology, Fri Nov 09 10:23:05 GMT+00:00 2007, Uncontrolled Copy, (c) BSI

5.5 Sprayhood

5.5.1 General

If any form of hood or sprayhood is fitted to cover the face in whole or in part to protect mouth and nose from water splash, the carbon dioxide level within the hood shall not exceed 5 % at any place at any time and shall not average more than 2,5 % in any 1 min, when tested in accordance with ISO 12402-9.

The sprayhood shall be stowed in a position which keeps it clear of the user's face. It shall not interfere with the operation of the lifejacket or create a hazard, for example through snagging.

The sprayhood shall be able to be unstowed and deployed to protect the airway whilst the user is in the water, with the lifejacket fully deployed and inflated, if inflatable. When deployed, it shall not impair the performance of the lifejacket in such a way as to render it no longer in conformity with the relevant requirements.

In particular, the sprayhood shall be fitted with a clear material compliant with ISO 12402-7 to enable the user to see sufficient of the surroundings in order to aid rescue operations. If, when deployed, the sprayhood reduces the effectiveness of any retroreflective material on the lifejacket itself, the sprayhood shall itself provide an additional retroreflective area at least equal to that obscured. The sprayhood shall be easily removable from its protective position, and shall be capable of being restored so that it does not fall back to its deployed position. Lifejackets including sprayhood conforming to this part of ISO 12402 shall be marked with "ISO 12402-8", suffixed with the word "sprayhood".

5.5.2 Gas exchange test

5.5.2.1 General

Gas exchange can be measured as oxygen decrease or carbon dioxide increase.

The values shall be measured under the sprayhood either on the right or left side of the face between nose and mouth and at a distance from the face centre line of $(10\,^{0}_{-3})$ cm.

Two test persons selected according to 5.2 shall be equipped with the lifejacket and activated sprayhood. They shall be positioned relaxed in quiet water.

The CO_2 and O_2 values are related as follows:

$\%\ CO_2 = 21\ \% - \%\ O_2$.

5.5.2.2 Procedure

5.5.2.2.1 Measurement of the absolute values with continuously working electronic equipment

The measurement shall be started 1 min after adjusting the sprayhood. Measurement duration shall be 5 min. The sprayhood fails if 5 % CO_2 is exceeded or O_2 falls below 16 % once.

5.5.2.2.2 Measurement of the average values with chemical reaction tubes or equivalent devices

The reaction tube shall be fixed directly at the measuring point without dead volume. The measurement shall be started 1 min. after adjusting the sprayhood. The duration of the measurement depends on the tube type. The sprayhood fails if the measured CO_2 average value of 2,5 % is exceeded or the measured O_2 average value is below 18,5 %.

Licensed Copy: Institute of Technology Tallaght, Institute of Technology, Fri Nov 09 10:23:05 GMT+00:00 2007, Uncontrolled Copy, (c) BSI

5.6 Protective covers

5.6.1 General

Protective covers shall improve service life and performance of the device. They shall be made of a material which is robust and resistant to the abrasion of wear in rough use. For requirements and testing of abrasion resistance, see ISO 12402-7:—[3], Table 14 and Annex B. Protective covers shall not impede the conformity of the entire device with ISO 12402-1 to ISO 12402-6, and themselves shall not prevent the device components from meeting the requirements specified in ISO 12402-7. PFDs with protective covers conforming to this part of ISO 12402 shall be marked with “ISO 12402-8”, suffixed with the words “protective cover” and the hazard protected against.

To conform with requirements caused by additional hazards, there might be certain requirements for the cover specified in standards for such applications, such as chemical resistance, etc. If so claimed, the cover shall be tested to the requirements of that standard and shall also be marked with the standard with which it complies. By covering those requirements, the PFD and its cover shall still maintain its function as a PFD according to the relevant part of ISO 12402.

For industrial application, the cover shall at least conform with the relevant requirements such as specified in 5.6.2.

After testing according to 5.6.2 and 5.6.3, the PFD shall still comply with the requirements as specified in the relevant parts of ISO 12402.

5.6.2 Additional hazards

5.6.2.1 Puncture resistance

5.6.2.1.1 Protective covers shall withstand, without puncture, the puncture resistance test according to 5.6.2.1.2.

5.6.2.1.2 The PFD, in its packed configuration, shall be placed front up on a rigid, smooth, flat plywood surface. The test point (see Figure 1) is to be pressed against the exterior protective cover at three different locations (such as each front side and the collar), perpendicular to the wall, and with a uniform speed of 2,5 mm/s to 5,0 mm/s until a force of 62 N is attained.

Dimensions in millimetres

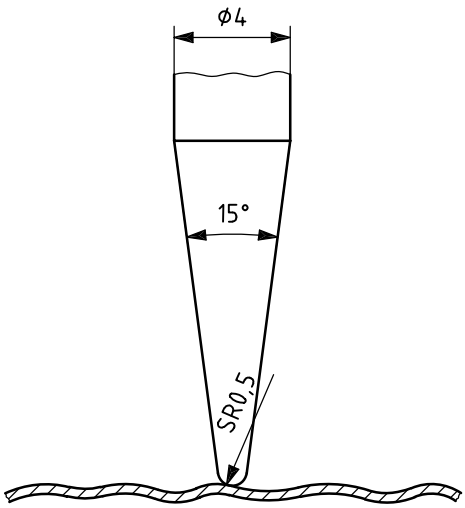

Figure 1 — Test point for puncture resistance

3) To be published.

标准分享网 www.bzfxw.com 免费下载

Licensed Copy: Institute of Technology Tallaght, Institute of Technology, Fri Nov 09 10:23:05 GMT+00:00 2007, Uncontrolled Copy, (c) BSI

5.6.2.2 Molten metal splash resistance

Protective covers shall not be perforated by the test of resistance to splashes of small molten metal particles in accordance with ISO 9150. Three test specimens are each to be subjected to 25 drops of mass (0,5 ± 0,03) g sprayed at a frequency of 1 drop every 3 s.

5.6.2.3 Burst strength

When tested for burst strength in accordance with ISO 13938-1 (for textiles, diameter 30 mm) or ISO 3303 (for coated fabrics), the burst resistance of materials when dry and when wet shall be not less than 19 N for the cover material tested under dry and wet conditions, and not less than 13 N for buoyancy chambers of inflatable PFDs. Twelve test specimens shall be used, six for dry tests held at (20 ± 1) °C and (65 ± 5) % relative humidity and six for wet tests immersed for (24 ± 0,1) h in a solution of distilled water with 1 % ethanol.

5.6.3 Marking

PFDs with additional resistance conforming to this part of ISO 12402 shall be marked with “ISO 12402-8”, suffixed with the words “cover with enhanced protection against …”.

5.7 Multi-chamber buoyancy systems

Multi-chamber buoyancy systems shall have at least two independent chambers. They may be of different design. The following types are the most common.

a) A buoyancy system consisting of two or more independently acting chambers which can be separated from each other. In this case, each operating chamber shall, when tested separately, conform to ISO 12402-4.

b) A buoyancy system consisting of two or more independently operating chambers which cannot be separated from each other. In case of an inflatable device, each of these chambers is capable of filling the entire PFD. In this case, each operating chamber shall be tested with the others deactivated. Each chamber shall be capable of providing 100 % of the buoyancy required under the relevant part of ISO 12402 but it shall conform at least to ISO 12402-4. Each operating head shall then be fired in turn, allowing a (30 ± 5) min period between each, until all the chambers have been fully inflated. No rupture or visible damage shall result.

   Most inflatable PFDs employ a “diaphragm” technique between the chambers to achieve an identical inflated shape of the PFD regardless of which chamber is filled.

c) A buoyancy system consisting of two or more independently operating chambers which cannot be separated from each other, and each of which provides a different and individual buoyancy. If inflatable all of which shall be capable of simultaneous inflation. In this case, each operating chamber shall conform at least to ISO 12402-4. This might lead to a total buoyancy which is higher than required under the relevant part of ISO 12402, such as is typical in case of a hybrid device.

Licensed Copy: Institute of Technology Tallaght, Institute of Technology, Fri Nov 09 10:23:05 GMT+00:00 2007, Uncontrolled Copy, (c) BSI

Annex A
(informative)

Classification of personal flotation devices

A.1 Classes

A.1.1 Lifejackets

These devices provide face-up flotation with levels of support sufficient for various open and rough water uses. Lifejackets have a buoyancy distribution sufficient to turn users, when tested on users wearing swimming costumes according to ISO 12402, to a position where the mouth has a defined freeboard above the water's surface, even when the user is unconscious.

A.1.2 Buoyancy aids

These devices should be comfortable for continous wear and provide lift without significant face-up turning ability, to float the conscious user with the level of support marked on the device. Buoyancy aids shall at least be suitable for sheltered waters, but at higher performance levels may be suitable for some users in other waters.

A.1.3 Special purpose lifejackets and buoyancy aids

These devices perform as in A.1.1 and A.1.2 with different levels of support, but have modifications related to special applications for use. These applications shall not relate to essential requirements such as in-water performance, stability and safety in use. The specific conditions for use shall be stated on their label to maintain essential requirements.

A.2 Performance levels

A.2.1 Level 275

This level is intended primarily for offshore use under extreme conditions. It is also of value to those who are wearing clothing which traps air and which may adversely affect the self-righting capacity of the lifejacket. It is designed to ensure that the user is floating in the correct position with his mouth and nose clear of the surface.

See ISO 12402-2.

A.2.2 Level 150

This level is intended for general application or for use with foul weather clothing. It will turn an unconscious person into a safe position and requires no subsequent action by the user to maintain this position.

See ISO 12402-3.

A.2.3 Level 100

This level is intended for those who may have to wait for rescue, but are likely to do so in sheltered water. The device should not be used in rough conditions.

See ISO 12402-4.

标准分享网 www.bzfxw.com 免费下载

Licensed Copy: Institute of Technology Tallaght, Institute of Technology, Fri Nov 09 10:23:05 GMT+00:00 2007, Uncontrolled Copy, (c) BSI

A.2.4 Level 50

This level is intended for use by those who are competent swimmers and who are near to bank or shore, or who have help and a means of rescue close at hand. These garments have minimal bulk, but they are of limited use in disturbed water, and cannot be expected to keep the user safe for a long period of time. They do not have sufficient buoyancy to protect people who are unable to help themselves. They require active participation by the user.

See ISO 12402-5.

Licensed Copy: Institute of Technology Tallaght, Institute of Technology, Fri Nov 09 10:23:05 GMT+00:00 2007, Uncontrolled Copy, (c) BSI

Bibliography

[1] ISO 12402-10, *Personal flotation devices — Part 10: Selection and application of personal flotation devices and other relevant devices*

[2] *International Convention for the Safety of Life at Sea (SOLAS)*, 1974, as amended, International Maritime Organization[4)]

4) IMO is an institution with domicile in London issuing regulations which are then published as laws by its Member States.

标准分享网 www.bzfxw.com 免费下载

Licensed Copy: Institute of Technology Tallaght, Institute of Technology, Fri Nov 09 10:23:05 GMT+00:00 2007, Uncontrolled Copy, (c) BSI

ANNEX ZA
(informative)

Relationship between this Standard and the Essential Requirements of EU Directive 89/686 EEC

This Standard has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association to provide a means of conforming to Essential Requirements of the New Approach Directive 89/686/EEC on the approximation of the laws of the Member States relating to personal protective equipment.

Once this standard is cited in the Official Journal of the European Communities under that Directive and has been implemented as a national standard in at least one Member State, compliance with the normative clauses of this standard given in Table ZA.1 confers, within the limits of the scope of this standard, a presumption of conformity with the corresponding Essential Requirements of that Directive and associated EFTA regulations.

Table ZA.1 — Correspondence between this Standard and Directive 89/686/EEC

Clause(s)/sub-clause(s) of this standard	Essential requirements (ERs) of Directive 89/686/EEC	Qualifying remarks/Notes
5.1; 5.5.1; 5.6	1.2.1 Absence of risks and other “inherent” nuisance factors	
5.6	1.3.2 Lightness and design strength	
5.5	2.3 PPE for the face, eyes and respiratory tracts	
5.2; 5.6; 5.7	3.4 Prevention of drowning (lifejackets and lifesaving suits)	

WARNING: Other requirements and other EU Directives may be applicable to the products falling within the scope of this standard.

Licensed Copy: Institute of Technology Tallaght, Institute of Technology, Fri Nov 09 10:23:05 GMT+00:00 2007, Uncontrolled Copy, (c) BSI

BSI — British Standards Institution

BSI is the independent national body responsible for preparing British Standards. It presents the UK view on standards in Europe and at the international level. It is incorporated by Royal Charter.

Revisions

British Standards are updated by amendment or revision. Users of British Standards should make sure that they possess the latest amendments or editions.

It is the constant aim of BSI to improve the quality of our products and services. We would be grateful if anyone finding an inaccuracy or ambiguity while using this British Standard would inform the Secretary of the technical committee responsible, the identity of which can be found on the inside front cover. Tel: +44 (0)20 8996 9000. Fax: +44 (0)20 8996 7400.

BSI offers members an individual updating service called PLUS which ensures that subscribers automatically receive the latest editions of standards.

Buying standards

Orders for all BSI, international and foreign standards publications should be addressed to Customer Services. Tel: +44 (0)20 8996 9001. Fax: +44 (0)20 8996 7001. Email: orders@bsi-global.com. Standards are also available from the BSI website at http://www.bsi-global.com.

In response to orders for international standards, it is BSI policy to supply the BSI implementation of those that have been published as British Standards, unless otherwise requested.

Information on standards

BSI provides a wide range of information on national, European and international standards through its Library and its Technical Help to Exporters Service. Various BSI electronic information services are also available which give details on all its products and services. Contact the Information Centre. Tel: +44 (0)20 8996 7111. Fax: +44 (0)20 8996 7048. Email: info@bsi-global.com.

Subscribing members of BSI are kept up to date with standards developments and receive substantial discounts on the purchase price of standards. For details of these and other benefits contact Membership Administration. Tel: +44 (0)20 8996 7002. Fax: +44 (0)20 8996 7001. Email: membership@bsi-global.com.

Information regarding online access to British Standards via British Standards Online can be found at http://www.bsi-global.com/bsonline.

Further information about BSI is available on the BSI website at http://www.bsi-global.com.

Copyright

Copyright subsists in all BSI publications. BSI also holds the copyright, in the UK, of the publications of the international standardization bodies. Except as permitted under the Copyright, Designs and Patents Act 1988 no extract may be reproduced, stored in a retrieval system or transmitted in any form or by any means – electronic, photocopying, recording or otherwise – without prior written permission from BSI.

This does not preclude the free use, in the course of implementing the standard, of necessary details such as symbols, and size, type or grade designations. If these details are to be used for any other purpose than implementation then the prior written permission of BSI must be obtained.

Details and advice can be obtained from the Copyright & Licensing Manager. Tel: +44 (0)20 8996 7070. Fax: +44 (0)20 8996 7553. Email: copyright@bsi-global.com.

BSI
389 Chiswick High Road
London
W4 4AL

标准分享网 www.bzfxw.com 免费下载